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Updated Interim Surveillance Case Definition for Severe Acute Respiratory Syndrome (SARS) — United States, April 29, 2003

CDC's interim surveillance case definition for severe acute respiratory syndrome (SARS) has been updated to include laboratory criteria for evidence of infection with the SARS-associated coronavirus (SARS-CoV) (Figure, Box). In addition, clinical criteria have been revised to reflect the possible spectrum of respiratory illness associated with SARS-CoV. Epidemiologic criteria have been retained. The majority of U.S. cases of SARS continue to be associated with travel*, with only limited secondary spread to household members or health-care providers (1).

* In this updated case definition, Taiwan has been added to the areas with documented or suspected community transmission of SARS; Hanoi, Vietnam is now an area with recently documented or suspected community transmission of SARS.

FIGURE. Clinical and laboratory criteria for probable and suspect severe acute respiratory syndrome (SARS) cases and SARS-associated coronavirus (SARS-CoV) infection — United States, April 29, 2003

Clinical criteria	Laboratory criteria for SARS-CoV		
	Laboratory-confirmed	Undetermined	Negative
	Reported to World Health Organization		
Mild respiratory* illness/ Asymptomatic			
Moderate respiratory illness			
Severe respiratory illness			

Legend:
□ Suspect case*
■ Probable case*

SARS has been associated etiologically with a novel coronavirus, SARS-CoV (2,3). Evidence of SARS-CoV infection has been identified in patients with SARS in several countries, including the United States. Several new laboratory tests can be used to detect SARS-CoV. Serologic testing for coronavirus antibody can be performed by using indirect fluorescent antibody or enzyme-linked immunosorbent assays that are specific for antibody produced after infection. Although some patients have detectable coronavirus antibody during the acute phase (i.e., within 14 days of illness onset), definitive interpretation of negative coronavirus antibody tests is possible only for specimens obtained >21 days after onset of symptoms. A reverse transcriptase polymerase chain reaction (RT-PCR) test specific for viral RNA has been positive within the first 10 days after onset of fever in specimens from some SARS patients, but the duration of detectable viremia or viral shedding is unknown. RT-PCR testing can detect SARS-CoV in clinical specimens, including serum, stool, and nasal secretions. Finally, viral culture and isolation have both been used to detect SARS-CoV. Absence of SARS-CoV antibody in serum obtained <21 days after illness onset, a negative PCR test, or a negative viral culture does not exclude coronavirus infection.

Reported U.S. cases of SARS still will be classified as suspect or probable; however, these cases can be further classified as laboratory-confirmed or -negative if laboratory data are available and complete, or as laboratory-indeterminate if specimens are not available or testing is incomplete. Obtaining convalescent serum samples to make a final determination about infection with SARS-CoV is critical.

No instances of SARS-CoV infection have been detected in persons who are asymptomatic. However, data are insufficient to exclude the possibility of asymptomatic infection with SARS-CoV and the possibility that such persons can transmit the virus. Investigations of close contacts and health-care workers exposed to SARS patients might provide information about the occurrence of asymptomatic infected persons. Similarly, the clinical manifestations of SARS might extend

* Meets epidemiologic criteria.

BOX. Updated interim U.S. surveillance case definition for severe acute respiratory syndrome (SARS) – United States, April 29, 2003

Clinical criteria

- Asymptomatic or mild respiratory illness
- Moderate respiratory illness
 - Temperature of $>100.4^{\circ}\text{F}$ ($>38^{\circ}\text{C}$)*, and
 - One or more clinical findings of respiratory illness (e.g., cough, shortness of breath, difficulty breathing, or hypoxia).
- Severe respiratory illness
 - Temperature of $>100.4^{\circ}\text{F}$ ($>38^{\circ}\text{C}$)*, and
 - One or more clinical findings of respiratory illness (e.g., cough, shortness of breath, difficulty breathing, or hypoxia), and
 - radiographic evidence of pneumonia, or
 - respiratory distress syndrome, or
 - autopsy findings consistent with pneumonia or respiratory distress syndrome without an identifiable cause

Epidemiologic criteria

- Travel (including transit in an airport) within 10 days of onset of symptoms to an area with current or recently documented or suspected community transmission of SARS[†], or
- Close contact[§] within 10 days of onset of symptoms with a person known or suspected to have SARS infection

Laboratory criteria[‡]

- Confirmed
 - Detection of antibody to SARS-CoV in specimens obtained during acute illness or >21 days after illness onset, or
 - Detection of SARS-CoV RNA by RT-PCR confirmed by a second PCR assay, by using a second aliquot of the specimen and a different set of PCR primers, or
 - Isolation of SARS-CoV
- Negative
 - Absence of antibody to SARS-CoV in convalescent serum obtained >21 days after symptom onset
- Undetermined: laboratory testing either not performed or incomplete

Case classification**

- Probable case: meets the clinical criteria for severe respiratory illness of unknown etiology with onset since February 1, 2003, and epidemiologic criteria; laboratory criteria confirmed, negative, or undetermined
- Suspect case: meets the clinical criteria for moderate respiratory illness of unknown etiology with onset since February 1, 2003, and epidemiologic criteria; laboratory criteria confirmed, negative, or undetermined

* A measured documented temperature of $>100.4^{\circ}\text{F}$ ($>38^{\circ}\text{C}$) is preferred. However, clinical judgment should be used when evaluating patients for whom a measured temperature of $>100.4^{\circ}\text{F}$ ($>38^{\circ}\text{C}$) has not been documented. Factors that might be considered include patient self-report of fever, use of antipyretics, presence of immunocompromising conditions or therapies, lack of access to health care, or inability to obtain a measured temperature. Reporting authorities might consider these factors when classifying patients who do not strictly meet the clinical criteria for this case definition.

[†] Areas with current documented or suspected community transmission of SARS include mainland China and Hong Kong Special Administrative Region, People's Republic of China; Singapore; Taiwan; and Toronto, Canada. Hanoi, Vietnam is an area with recently documented or suspected community transmission of SARS.

[§] Close contact is defined as having cared for or lived with a person known to have SARS or having a high likelihood of direct contact with respiratory secretions and/or body fluids of a patient known to have SARS. Examples of close contact include kissing or embracing, sharing eating or drinking utensils, close conversation (<3 feet), physical examination, and any other direct physical contact between persons. Close contact does not include activities such as walking by a person or sitting across a waiting room or office for a brief period of time.

[‡] Assays for the laboratory diagnosis of SARS-CoV infection include enzyme-linked immunosorbent assay, indirect fluorescent-antibody assay, and reverse transcription polymerase chain reaction (RT-PCR) assays of appropriately collected clinical specimens (Source: CDC. Guidelines for collection of specimens from potential cases of SARS. Available at http://www.cdc.gov/ncidod/sars/specimen_collection_sars2.htm). Absence of SARS-CoV antibody from serum obtained <21 days after illness onset, a negative PCR test, or a negative viral culture does not exclude coronavirus infection and is not considered a definitive laboratory result. In these instances, a convalescent serum specimen obtained >21 days after illness is needed to determine infection with SARS-CoV. All SARS diagnostic assays are under evaluation.

**Asymptomatic SARS-CoV infection or clinical manifestations other than respiratory illness might be identified as more is learned about SARS-CoV infection.

beyond respiratory illness. As more is learned about SARS-CoV infection, clinical and laboratory criteria will provide a framework for classifying the full spectrum of infection (Figure).

This surveillance case definition should be used for reporting and classification purposes only. It should not be used for clinical management or as the only criterion for identifying or testing patients who might have SARS or for instituting infection-control precautions (4,5). This definition will be updated as new data become available or if changes in the epidemiology of SARS occur in the United States.

References

1. CDC. Update: Severe acute respiratory syndrome — United States, 2003. *MMWR* 2003;52:357–60.
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3. Drosten C, Gunther S, Preiser W, et al. Identification of a novel coronavirus in patients with severe acute respiratory syndrome. *N Engl J Med*. Available at <http://content.nejm.org/cgi/reprint/NEJMoa030747v2.pdf>.
4. CDC. Updated interim domestic guidelines for triage and disposition of patients who may have severe acute respiratory distress syndrome (SARS). Available at http://www.cdc.gov/ncidod/sars/triage_interim_guidance.htm.
5. CDC. Interim guidance on infection control precautions for patients with suspected severe acute respiratory syndrome (SARS) and close contacts in households. Available at <http://www.cdc.gov/ncidod/sars/ic-closecontacts.htm>.

All *MMWR* references are available on the Internet at <http://www.cdc.gov/mmwr>. Use the search function to find specific articles.

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